

REMARKS

I. Status of the Claims

Claims 1-2 and 4-13 are currently pending. Claims 3 and 14 have been previously cancelled. Claims 1-2 and 4-13 stand rejected. Applicants amended claim 2 to clarify that there is no fluid passages in the bipolar plate closest to the negative terminal of the fuel cell of the claimed invention. Support for this amendment can be found in Figure 6 as well as in the second full paragraph at page 11 of the as-filed specification.

No new matter has been added by this proposed amendment nor does this amendment raise new issues or necessitate the undertaking of any additional search of the art by the Examiner. All of the elements and their relationships now claimed were earlier claimed in the claims as examined. Therefore, this Amendment under 37 C.F.R. § 1.116 should allow for immediate action by the Examiner. The proposed amendments, moreover, place the claims in condition for allowance or, at least, in better form for appeal, if necessary.

Upon entry of the proposed amendment, claims 1-2 and 4-13 will be pending and under examination. Reconsideration of the application, as amended, is requested in view of the remarks below.

II. Objection to the Drawings

Figures 1 and 2 have been objected to since they illustrate prior art but were not so designated. See Office Action at 2. Applicants have amended Figures 1 and 2 to designate them as "Prior Art" and request the withdrawal of the objections.

III. Claim Rejections Under 35 U.S.C. § 112

Claim 1-2 and 4-13 have been rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement since “[t]he claim(s) contains subject matter which was not described in the specification in such a way to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.” Office Action at 2-3. Specifically, the Examiner alleges that the feature of a conductive spacer was disclosed in the description of Figure 1, which depicts prior art, but not in Figures 3-7, which depict the embodiments of the current invention. *Id.* Applicants disagree with the Examiner’s conclusion.

At the outset, none of the drawings in the present application individually discloses all the features of the fuel cell it depicts. One cannot rely solely on the drawings to determine whether a claimed feature is disclosed in the specification or not. Even though it is not depicted in Figure 3-7, the feature of the conductive spacer, set forth in claim 1, was disclosed in the embodiments of the claimed invention.

For example, Applicants described the “cooling device” in the paragraph bridging pages 6 and 7 in the as-filed specification when explaining Figure 1: “the cooling devices consisting of a shell fed with demineralised water, delimited by two adjacent bipolar plates (6), provided with peripheral sealing gaskets (10) and containing a conductive spacer (11) directed to maintain the longitudinal electrical continuity between the two adjacent bipolar plates.” Specification at page 6, line 29 to page 7, line 2. All the elements of the cooling device mentioned above are present in Figure 2, including

the bipolar plate (6), the peripheral sealing gaskets (10), and the conductive spacer (11). See Specification at page 9, second full paragraph.

In Example 1, Applicants tested three stacks: Stack A is of the same design as depicted in Figure 2; Stacks B and C are the first and the second embodiments of the invention, respectively. See Specification at page 12, line 16 to page 17, line 24. Applicants further indicated that “[t]he three stacks were provided with elements equivalent to the cooling devices.” See Specification at page 13, first full paragraph. One of ordinary skill in the art, reading these disclosures, would appreciate that Stacks B and C comprise the same cooling device as in Stack A, which comprises the electrically conductive spacer (11).

For at least the reasons above, Applicants submit that the electrically conductive spacer was disclosed as a feature in the embodiments of the claimed invention. Applicants respectfully request the withdrawal of the rejections.

IV. Claim Rejections Under 35 U.S.C. § 103(a)

The Examiner made the following obviousness rejections under 35 U.S.C. § 103(a):

- claims 1 and 6 are rejected over Faita (EP 0 629 015 A1) in view of “Applicants’ Admitted Prior Art” (specification at page 6, line 24 - page 7, line 5) (see Office Action at 3-4);
- claims 4 and 5 are rejected over Faita in view of “Applicants’ Admitted Prior Art,” and further in view of Abd Elhamid (US 2005/0267004 A1) (see Office Action at 4-5);

- claims 7 and 8 over Faita in view of “Applicants’ Admitted Prior Art” as applied to claim 1, further in view of Baldauf (US 2003/0027031) (see Office Action at 5-6);
- claim 2 over Faita in view of “Applicants’ Admitted Prior Art” as applied to claim 1, further in view of Kikuchi (US 2003/0162078) (see Office Action at 7);
- claims 9 and 10 over Faita in view of “Applicants’ Admitted Prior Art” as applied to claim 1, and further in view of Schmid (US 6080503) and Wald (US 7087339 B2) (see Office Action at 7-8); and
- claims 11 to 13 over Faita in view of “Applicants’ Admitted Prior Art,” Schmid, Wald as applied to claim 9, and further in view of Barton (US 6423439 B1) (see Office Action at 8-9).

Applicants respectfully disagree and traverse these rejections. To establish a prima facie case of obviousness, three basic criteria must be met. These criteria include that the Examiner show there would have been some rationale, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify and combine reference teachings, and that the Examiner show that there would have been a reasonable expectation that the proposed modification will be successful. See M.P.E.P. 2143.02. If no such reasonable expectation of success exists, the proposed modification could not have been obvious. *Id.* Furthermore, the proposed modification cannot be considered obvious if it would render the prior art unsuitable for its disclosed purpose. See M.P.E.P. 2143.01. Applicants respectfully

point out that neither requirement can be met for the combination and modification proposed by the Examiner.

Rejection to claim 1 is improper.

With respect to claim 1, the Examiner alleges that Faita discloses all claim elements except for “a cooling device [comprising] an electrically conductive spacer. Office Action at 4. The Examiner then states “Applicants’ Admitted Prior Art” discloses this element as well as the cooling fluid flowing through the cooling devices. *Id.* Therefore, the Examiner concluded, “[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to include the cooling device of Admitted Prior Art in the fuel cell of Faita **because the spacer maintains the electrical continuity between adjacent bipolar plates and the fluid flowing through the cooling device keeps the fuel cell at the temperature required for it to run efficiently.**” *Id.* Emphasis added.

The Examiner appears to suggest that maintaining electrical conductivity and fuel cell temperature provides the rationale to combine Faita and “Applicants’ Admitted Prior Art.” Applicants strongly disagree because both Faita and “Applicants’ Admitted Prior Art” have distinct means for these purposes. There is no need to combine these means and, indeed, the combination proposed by the Examiner may not work.

At the outset, both the fuel cell of Faita and “Applicants’ Admitted Prior Art” are functioning fuel cells. One skilled in the art would appreciate that functioning fuel cells have means to maintain electrical conductivity and fuel cell temperature. In fact, Faita fuel cells are stacked together without a cooling devices interposed between two adjacent fuel cells. See Faita, Fig. 1, Fig. 6, and page 6, lines 5-14. The electrical

conductivity from cell to cell is ensured by the fact that each pair of adjacent fuel cells share a bipolar plate. To remove extra reaction heat, Faita optionally provides an internal duct (5) for the passage of a suitable cooling fluid. See Faita, Fig. 2. However, for reasons of record, the internal duct is located in the peripheral frame area of the bipolar plate. See Reply to Office Action filed October 29, 2007 at pages 6-7.

Comparing the cooling means of Faita with the cooling device disclosed in "Applicants' Admitted Prior Art," one would readily appreciate that in the latter the cooling fluid flows between the space created by a porous, electrically conductive spacer sandwiched between two bipolar plates. Therefore, one skilled in the art would not have confused the cooling means in Faita with the cooling means of the "Applicants' Admitted Prior Art."

Applicants further submit that one skilled in the art would not be motivated to combine Faita and "Applicants' Admitted Prior Art." This is because both Faita and "Applicants' Admitted Prior Art" already have functioning but distinct cooling means, which are not interchangeable or compatible.

Because Faita and "Applicants' Admitted Prior Art" disclose two distinct cooling means which are not interchangeable or compatible, one skilled in the art would not have been motivated to replace one with the other, as suggested by the Examiner. Applicants respectfully request the withdrawal of the rejection to claims 1.

Rejection to claim 2 is improper

The Examiner maintains the rejection to claim 2 under 35 U.S.C. § 103(a) as unpatentable over Faita in view of "Applicants' Admitted Prior Art," as applied to claim 1, and further in view of Kikuchi. See Office Action at 7. The Examiner alleged that "[i]t

would have been obvious to one of ordinary skill in the art at the time of the invention to place the terminal plates near the ends of the cell without openings in order to prevent fluids from passing near the terminal ends.” *Id.* In reaching that conclusion, it appears that the Examiner has confused the terminal plates 34a and 34b in Kikuchi as the equivalent to the bipolar plates recited in the current claims. (Note that claim 2, as amended, is directed toward a bipolar plate, not a terminal plate.) Applicants disagree and would like to direct the Examiner’s attention to Figure 7 in Kikuchi.

The fuel cell stack depicted in Figure 7 in Kikuchi is formed by stacking together a plurality of unit cells 12, each comprising a membrane electrode assembly 20 and separators 22a, 22b. See Kikuchi at paragraph [0007]. Further, “[e]ach of the separators 22a, 22b has a first reactant gas flow passage 24 on its surface facing the anode 14, and a second reactant gas flow passage 26 on its surface facing the cathode.” *Id.* On the other hand, “[t]erminal plates 34a, 34b are electrically connected to the outermost unit cells 12 disposed at opposite ends of the stack body 13.” See Kikuchi at paragraph [0008]. Figure 7 clearly shows a separator having flow passage on its face between the membrane electrode assembly and the terminal plates 34a and 34b, respectively.

Therefore, one skilled in the art, reading Kikuchi, would readily appreciate that the separators 22a, 22b are elements in every unit cell but the terminal plates 34a and 34b are not a part of the unit cells, but are plates in contact with the separators of the unit cells on both ends of the fuel cell stack. Because the bipolar plates set the boundary of a unit cell as in the invention recited in claim 2, they are the functional equivalent of the separators, not the terminal plates. Therefore, it is incorrect for the

Examiner to impose features of the terminal plates in Kikuchi onto the bipolar plates of the invention recited in claim 2. One skilled in the art would have understood that whether the terminal plates in Kikuchi has passage openings or not is irrelevant in determining whether Kikuchi discloses a bipolar plate without passage openings for fluids.

Nevertheless, in order to advance prosecution, Applicants have amended claim 2 to clarify that the bipolar plates closest to the negative terminal is free of openings for fluid passage, as that bipolar plate may still have openings for tie rods. See part 6 in Figure 6 of the current specification.

For at least the reasons above, and also for the reason that claim 2 is dependent from and narrows the scope of patentable claim 1, Applicants respectfully request the withdrawal of the rejection to claim 2, as amended.

Rejections to other claims dependent from claim 1 are improper.

Claims 4-13 have been rejected over Faita in view of "Applicants' Admitted Prior Art" and further in view of a third or forth reference, as listed above. However, all these claims are dependent from and have narrower scope than that of claim 1. For at least the reasons that claim 1 is patentable over Faita and "Applicants' Admitted Prior Art," claims 4-13 are patentable over the prior art references. Applicants respectfully request the withdrawal of the rejections.

V. Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims 1-2 and 4-13.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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